URBANIZATION, GOVERNMENT POLICIES AND GROWING FOOD INSECURITY IN KATHMANDU METROPOLIS

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Introduction

The problems of food insecurity have appeared in cities in recent decades as the global poverty profile takes on a more urban face. Due to rapid population growth, inequalities in the distribution of resources like land and agricultural modernization, landlessness among rural poor has significantly increased. These poor and landless people are now migrating to urban centers in search for a means of livelihood (OXFAM 1995).

Towns in the Kathmandu valley have experienced such an inflow of poor and landless people. In recent times, street children are also migrating to Kathmandu in increasing numbers. Poverty, violence within the families and neglect of children are responsible for their migration to Kathmandu, where they remain as street-children (Onta-Bhatta 1996, 1997). But at the same time wealthier people from other parts of the country have also been migrating to Kathmandu valley mainly to avail themselves of urban facilities like education, health care and white-collar employment. Most of these modern facilities are concentrated in Kathmandu due mainly to the centralization of political and economic power over a long period. Since the mid-1980s the valley towns have also been affected by the economic policy of liberalization adopted by the government. This policy was adopted, as in other developing countries, mainly to correct the problems raised due to excessive debt and deterioration in the terms of trade. But the brunt of these policies have been borne by the urban poor in the form of cuts in employment in industries (e.g., metal and textile industries), reduced wage rate, increase in the price of food stuffs, housing and utilities, and severe environmental pollution. All these problems have led to severe urban food insecurity.

This study attempts to explore the changes in the food systems of the Kathmandu valley brought about by urbanization and then examines food security situations and the impact of government policies in this regard. It is revealed that physical well-being of the poorer households is affected not only by insufficient food (due to unemployment and increase in price of food items), but also by air and water pollution. As a growing section

Studies in Nepali History and Society 4(1): 191-246 1999

of the population is affected by food insecurity, the society will have to incur a heavy cost in the future.

Understanding Urban Food Systems: Some Theoretical Concepts

It has often been assumed that hunger and starvation are distinctively problems of rural areas. Therefore, researchers in this field neglected urban areas. Food security research mainly concentrated on rural food production and on the scope for its increase. On the other hand, urban areas have generally faced malnutrition, which is difficult to detect and takes a long time to correct. But its toll is usually greater than devastating but episodic famines. As compared to rural areas, urban space is very diverse in terms of differences in the living conditions of people, their political and economic power and access to resources and infrastructure. Therefore, the general average situation revealed from government statistics masks the reality about the situation of poor neighborhoods and families in a city or town.

Gartel (1995) identifies three approaches in studies related to urban food systems: a conventional policy-oriented approach, a historical approach from the perspective of political economy, and a crisis-oriented approach focusing on vulnerable food systems. The policy-oriented approach addresses the nutritional situations in cities while the historical political-economy approach reconstructs urban history and analyzes the social embeddedness of food provisioning systems. The third approach to urban food system concentrates on the issues of food security and vulnerability.

The works of A.K. Sen, particularly *Poverty and Famines* (1981), have provided a new concept for the understanding of food insecurity. His work shows that enough food availability is not a sufficient condition for avoiding a hunger or famine. What is also important is the entitlement to food. In a situation where food entitlement declines (due to insufficient purchasing power and limited resources to enable entitlement through production, purchase and exchange, or due to increase in food prices in relation to income) famine or hunger is likely to occur. The concept of entitlement helps us to integrate the spheres of food production, food exchange, and food consumption and locate the vulnerable individuals, households or places. The concept of vulnerability disaggregates the concept of poverty, as it is not always the poor that are affected by famines or hunger. Watts and Bohle (1993) suggest applying a combination of three different analytical approaches to examine

vulnerability: the entitlement approach (dealing with decline in access to food), the empowerment approach (dealing with institutional failure in securing the basic right to food security) and a political economy approach (dealing with inequalities that lead to food insecurity).

In their book *Hunger and Public Action*, Dreze and Sen (1993) list a number of conditions which are important for analyzing food security situations. Of particular importance to the study of urban food security, is the institution of wage labor. As city dwellers, particularly the poor, possess no means of production except their labor, they become vulnerable to changes in market conditions like decline in wages vis-à-vis food prices and to production conditions which may result in unemployment. This is particularly so in the context of Kathmandu as it is undergoing an intermediate phase in its process of transformation from an agrarian society to an industrial/service economy. Accordingly the class of wage laborers has become large in Kathmandu, but a formal system of social security (from the state) has not yet developed. On the other hand this phase is characterized by erosion of traditional social security systems.[1]

The concept of capability (Dreze and Sen 1993) is also important in the study of urban food security as the goal of public policy should be to make all capable of avoiding undernourishment and escaping deprivations associated with hunger. Improving capability means much more than providing adequate food, as the relationship between food intake and nutritional status can vary greatly depending not only on age, sex, pregnancy, metabolic rates, climatic conditions and activities, but also on access to complementary inputs such as health care, drinking water, and education, and on the prevalence of epidemics and diseases, environmental pollution and so on. Accordingly, Dreze and Sen (1993:13) argue that "focus on entitlements, which is concerned with the command over commodities, has to be seen as only instrumentally important, and the concentration has to be, ultimately, on the basic human capabilities."

In this study also, it is seen that food consumption levels and effects of sickness depend not only on income level, but also on other socio-economic parameters like education, skills, family size, food production opportunities and exposure to pollution. Even though all these factors

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1 Examples, in case of Kathmandu, can be taken of the *guthis* (associations to perform some religious ceremonies and involve common property), food donations for religious merits and traditional moral economy emphasizing the care of children and elderly in the family and religious shelters (discussed later).

were interrelated, their relative influence differed from one location to another. For example in a neighborhood where civil servants predominate, education was found to be the main determinant of food consumption level. In this community, families with higher education had smaller families with a lower incidence of illness. In communities of people having traditional skills, the food security situation was comparatively better. In squatter settlements, income as well as education levels were low as compared to other communities, and the nature of work undertaken by its residents demanded constant exposure to air, water and soil pollution. Accordingly, incidence of sickness was found to be high. Families with similar income in other communities had managed to remain healthy, mainly because of the nature of work (office work instead of manual and semi-skilled work), and a higher degree of awareness about sanitation and clean water.

In sum this study shows a great diversity between different communities in their food security situations. Moreover, there is also a wide diversity within each community. A similar conclusion was also reached in a prior study conducted in Kaski district, which revealed the importance of family structure (family size and illness of family members) in determining food security and well being (Adhikari and Bohle 1999). But in this present study, family education was also found to be important in determining the relative success of households in securing food and in improving the capabilities of family members. In remote areas of Kaski district where the previous research was conducted, most households were illiterate, and only a few had an elementary education. Education was thus not significant in determining differences in food security. On the other hand, physical strength was of prime importance in determining food security in different communities. But in an urban context, as this study shows, the determinants of food security varied greatly from one community to another, mainly because of differences in their occupational structure.

As food security generally implies adequate food for all at all times, food security research should look into vulnerability at the individual level. The entitlement approach that is generally used in vulnerability analysis is of a disaggregative nature – beyond the class analysis. The logic of the entitlement approach indicates that it should take into account, among other things, the occupational groups, vulnerability of households and individual variability within those groups, depending upon various socio-economic influences. Along these lines, Blaikie et al. (1994), in their 'access model' extend analysis to the household level and

also give consideration to the gender and age composition of each household. This is particularly important in the context of an urban area.[2]

Urban space generally consists of a continuum from less built-up areas to a core urban area. As a result, food systems and livelihood strategies differ widely along a transect in an urban area because of differences in specialization in occupation. For example, peripheral areas even in a city may give emphasis to farming. In Kathmandu this type of occupational specialization is clearly visible. Accordingly, in this research, case studies were selected to represent different settlements specializing in different occupations. In the case of Kathmandu, urban space has also traditionally been allocated or organized according to cultural and religious purposes.[3] The imprints of this pattern can still be seen today, even though these criteria are not followed nowadays in building houses.

The 'access model' developed by Blaikie et al. (1994) indicates that lack of access to resources is the main reason for the vulnerability of households. The model states that social-political processes operate to further deteriorate the access position of vulnerable households. The processes iterate and force the vulnerable households to an unsafe position. In urban settings where most families lack access to land and other resources needed for food production, the most important resource, as revealed in this study, is the ability to earn more and to gain knowledge about the efficient use of income and about enhancing human capability. For this, education and skill were found to be important. Similarly, in addition to food, other complementary facilities (like health support and clean water and air) are important to reduce the extent of sickness in poorer neighborhoods. This finding is important in devising development programs for the vulnerable individuals and families and for appropriate public action by concerned citizen groups.

Urbanization and Food Security in Kathmandu valley

Urban growth in Kathmandu valley has been fast, especially since the early 1950s, not only due to natural growth of population of the valley, but also due to migration of people from other parts of the country for

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2 As it was extremely difficult to analyse data at the individual level, information was collected for this study at the household level. Households of each community were then grouped according to their food consumption level. The number of groups was large enough to reduce the impact of averages on the variation in the groups.

3 For example, closely related families used to share one *bahāl* (square), and members of low caste lived on the outskirts of the settlements

employment and to avail themselves of urban services like education and health.[4] Even though urban centers now have appeared in other parts of the country, urban growth was confined to the fertile valley of Kathmandu until the middle of the present century.[5]

Opinions about the origins of the cities in Kathmandu valley are still largely based on myths. Evidence from the historical record reveals that the first sizable city was established, most probably, in the Lichchavi period (c. 300-800 AD). It was only in the 12th-13th centuries that three cities (Kathmandu, Lalitpur and Bhaktapur) were developed in the Kathmandu valley. These cities remained as three micro-states until 1769, when the valley was annexed to the Gorkhali state, which was, later on, named as Nepal. During the Malla period (12th – 18th century) these three cities acquired an urban character. Until this period, these cities were developed from religious point of view (Sharma 1989).[6] But in the past four or five decades, Kathmandu valley cities and towns have undergone a rapid restructuring in spatial structure due to inflow of people and capital and changes in economic and business opportunities which have arisen mainly due to changes in the political system and economic integration with the world economy.

The fundamental impulse for urbanization of Kathmandu and sustenance of its growth during the Malla period (13th-18th century) came from its role as a center of entrepot trade due to its location between India and Tibet. This long distance trade facilitated urban growth in the valley. By the 15th century, valley towns effectively controlled the Tibetan trade. Traders from as far away as Kashmir were also attracted to Kathmandu to exploit the opportunities it offered in business. As the Kathmandu valley was very fertile, agriculture production was more than sufficient for local consumption during the Malla period. The surplus production also helped in the enhancement of arts, culture and cottage industries. Therefore, trade

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4 Even though this research is about urban food security, the whole Kathmandu valley has been taken into account while analyzing food security situations based on secondary information. This has to be done as the data are not available only for the built-up areas. But case study sites were selected to represent urban and semi-urban areas.

5 At present (1999), there are 58 *nagar pālikās* (town and cities) in Nepal. These are generally referred as urban centers, even though many of them still retain rural characteristics.

6 Kathmandu city was developed in the shape of the sword or scimitar of Devi, Lalitpur in the shape of Sudarshan Chakra (the revolving wheel) of the god Vishnu, and Bhaktapur in the shape of the conch shell of the god Vishnu.

backed by surplus production actually helped in the development of urban culture in the valley. Gradually, a distinctive division of labor among the native population of the valley, Newars, based on a complex social structure and occupational characteristics began to evolve (Regmi 1978:23).

After the annexation of the valley by the Gorkhali state in 1769, Kathmandu became its capital, and thus the seat for political, economic and social power. The period from 1750 to 1850 was extremely disruptive because of the unification process, occasional wars with Tibet and British-India and internal political factors like excessive taxation and other obligations (e.g., labour) to the state. Since then this trade gradually lost its impetus. Trade with Tibet finally came to an end by the late 1950s, due to its annexation by China in 1959. Even though some urban growth took place between 1850-1950, it was mainly due to the status of Kathmandu as the political, administrative and cultural capital of the country.

Reliable population figures for the valley towns prior to 1952/54 are not available. The estimate made in 1793 by Kirkpatrick based on number of houses was 50,000 (Kirkpatrick 1986 [1811]:161). Similar estimate made by Oldfield in 1880 range between 60,000 to 80,000 (Oldfield 1974[1880]:108). The census of 1920 puts the population of Kathmandu, Lalitpur and Bhaktapur districts at 108,805, 104,928 and 93,176 respectively. In 1941, it was estimated that 131,143 people lived within the built-up area of three cities of the valley (Sharma 1989:8). Urban population of Kathmandu is about 56% of the total population of the valley, which was approx. 1.1 million in 1991 and 1.3 million in 1994/95 (Adhikari 1998).[7]

The rich soil with intensive agricultural practices supported a large population in the valley for many years. However, population and urban infrastructure have grown exponentially, consuming a large part of

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7 The proportion of urban population, however, depends upon the definition of 'urban area' adopted by the government. At present, municipalities are considered as urban areas, but municipalities are declared not only based on population and infrastructure, but also for political reasons. There are many settlements in the Kathmandu valley which are considered as villages, but in fact are denser with urban infrastructures than some of the municipalities in the hills and Tarai. Popualation of three districts in Kathmandu valley in 1994/95 was – 820,256 for Kathmandu district, 306,463 for Lalitpur district and 186,037 for Bhaktapur district. Thus the total population for that year in the valley was 1,312,756 (MOA 1996).

agricultural land. By 1971, urban area in Kathmandu valley was spread on about 1500 ha. and in 1991 it had reached to 4500 ha. (Amatya 1996:104). During the Rana rule (until 1950), Kathmandu was to a very small extent dependent on its hinterland and hills districts for good quality milk and milk products, grains, meat and fruits. Usually Ranas, royals and other elite imported these products from villages, not because of insufficient food production within valley, but for luxury. A small quantity of foodgrains (rice) was also brought from the Tarai for feeding the military and, to a lesser extent, the civil servants. But from 1950s onward Kathmandu's dependence on the Tarai for food grew significantly,[8] as food production in the valley was insufficient to meet the requirements of the growing population. In recent times, the Tarai's capacity to produce surplus food has been declining owing to increase in population and decline in the productivity of land. Kathmandu has now become more dependent on India for cereals and fruits. Kathmandu still receives a small quantity of food grains from its rural or semi-urban areas, but this source is insignificant in comparison to imports from India (discussed later).

After the annexation of Kathmandu valley to the Gorkhali state (later called Nepal) in 1769, some workers and peasants from the hills would have migrated to Kathmandu valley along with the Gorkhali rulers. After the Anglo-Nepal War (1814-1816), Nepal ceded a large part of its land to British-India and, according to Malla (1972:62), some people from these

8 One of the reasons for growing dependence on the Tarai for food after 1950 was that Kathmandu's agricultural system remained very traditional and subsistence oriented. (Malla 1972:62). He cites Bishop's observation made in 1952 that, "the methods of agriculture have not altered much since Kirkpatrick first recorded in the late 18th century. The *koo* (spade), *kuchimuga* (wooden plank), *koomuga* (a long wooden hammer) and various other implements used for different field works were, and still are, just the same as they were some hundred years ago." Reasons for the backwardness in agriculture that are generally cited include closing of the country from outside influences and the negligence of the ruling class in uplifting the economy of the country, particularly of the peasants. In addition, the tenurial structure in Kathmandu was very complex and a large part of land was distributed in the form of grants to families involved in administration and military (see Regmi 1999a[1976]). Actual farmers were not, to say the least in an advantaged position. Despite this backwardness in agriculture, food production for the residents of Kathmandu was sufficient. Whether its distribution across the population was sufficient is another question. Malla (1972:62) gives the example that children in the past used to play marbles with tomatoes and potatoes.

territories came to Kathmandu and settled here. Indian traders began to enter the valley in large numbers when the British Resident Brian Hodgson appealed to Indian businessmen after a careful survey of internal and external trade of the country in 1831. Moreover, the Tamangs, who were forced to migrate from their homes in the mountains of eastern Nepal, had sought refuge in the forested parts of the surrounding mountain rim of Kathmandu (Malla 1972:62).[9] At the same time, the valley was becoming more and more important as a cultural, political and administrative center, and people from other parts of the country began to migrate to Kathmandu. Initially only wealthier people were attracted to the capital city. As Nepal's governments[10] historically adopted a centralized policy, all schools, universities, communication facilities existed only in Kathmandu. Moreover, people had to go to Kathmandu for even a minor official purpose. This centralized power together with boom in construction of palaces during the Rana regime and housing expansion during the 1960s and 1970s also attracted wage laborers and poorer people. Trade opportunities expanded, as Kathmandu was the only city linked to other countries by air. Accordingly, business people of the country as well as from India came here to settle. Construction boom has also attracted laborers and semi-skilled people from India.

The population of Kathmandu increased by 26 % from 1970 to 1980, and another 44% between 1980 and 1990. The growth in population has been accompanied by a doubling in the number of vehicles in the 1980s. In 1993, there were 67,000 registered vehicle in Kathmandu valley (URBAIR 1996). To cater the need of housing expansion, brick kilns expanded exponentially. Their (Bull's trench kilns) number tripled in a decade—from 102 in 1984 to 305 in 1993 (URBAIR 1996). Expansion in garment and carpet factories likewise brought people (belonging to poorer classes) from the hills, Tarai and India. In 1991/92, there were approximately 2,200 industrial establishments with more than 10 employees as compared with 1,504 industries in 1986/87 (CBS 1996).

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9 See Holmberg et al., this volume, for a history of the labour obligations of these Tamang communities to the Kathmandu administration and elite.

10 Until 1950, it was a dictatorial rule. Centralization of political and economic power is a common characteristic of this type of rule. Except for a brief period of liberalization in the political and economic system, Nepal again endured (from 1960 to 1990) a sort of dictatorial political system (Panchayat system). It was during this time that Kathmandu experienced a maximum growth in population, housing, and industries and in pollution.

The carpet industry attracted a large number of laborers to Kathmandu. By 1992, there were about 300,000 carpet laborers of which 50% were children under 16 years of age, a figure which declined to 200,000 in the late 1990s.[11] Besides playing a role in population increase, carpet factories are also responsible for chemical pollution of the water system in Kathmandu valley. Because of growth in industry and housing, demand for land in Kathmandu has been very high. As a result, its price has increased rapidly. According to Kansakar (1988: 58), the price of a ropani (0.05 ha.) of land increased from Rs 1,000 - 7,000 in 1964 to Rs 42,000 in 1978 and to Rs 561,000 in 1985. But in the 1990s, the price of land has remained stagnant, mainly due to a slow down in economic activities and increased pollution.

Migration of poor and homeless people has resulted in the development of squatter settlements in Kathmandu.[12] Gallagher (1992) estimated that there were about 8,000 to 10,000 squatters[13] in Kathmandu in 1992, more than double their population in 1988. The squatter settlements are mostly located in marginal areas like the banks of Bagmati and Bisnumati rivers. These are the most polluted areas with a constant stench in the air. Some poor families also make their living by selling tea and snacks near road junctions or carry goods for others in pushcarts or work as tempo, taxi and rickshaw drivers or helpers. These occupations constantly expose the workers to air, and noise pollution. Moreover, due to fluctuations in the job market and lack of resources for the production of food, they face the greatest risks in securing food supply. Because of their illegal occupancy of public land, they are also not vocal in demanding public facilities from the government. It is mainly because of the squatter settlements that there were, in 1990, about 10,000 houses not

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11 Personal communication, Elvira Graner, 1999.

12 In total there are about 47 such settlements in Kathmandu. In the past, the government also demolished a few of these settlements. The largest settlements include: Thapathali, Sankhamul, Anamnagar, Bhaudha, Chabbel, Maharajgung, Samakhusi, Mahaepi, Balaju, Dullu and Kalimati. Apart from these settlements, homeless people, often old and destitutes, have been living in Dharmasala, Pati, Pauwa, Sattals (these are the public shelters made in the past for the religious persons and for pilgrims) and in temple premises (based on discussion with 'Commission for Squatter Settlement in Kathmandu', 1998).

13 Squatting refers to occupation of land on which one possesses no *lāl purjā* (land ownership certificate), or in case of renters, the occupation of land, houses or rooms to which the landlord possesses no ownership certificate (Gallagher 1992).

good enough for human habitation. About 21% of the population of the valley were then homeless (Shrestha and Kaltenborn-Lunde 1990:7 cited in Gallagher 1992). Street children, who are also called *khāte* (for detail see Onta-Bhatta 1996, 1997), are also migrating to Kathmandu in increased numbers. In 1993, their number was 1500, three times than in 1990. Onta-Bhatta argues that increase in the number of street children is not simply the result of poverty as was generally assumed, but of breakdown in family support systems, domestic violence and parental neglect and abuse (Onta-Bhatta 1996:194).

Even though Kathmandu was initially developed based on religious considerations—the older parts of the city illustrate this point—it has grown very rapidly without any urban planning framework (cf. Shah 1998) due mainly to population pressure as discussed above. The unregulated growth is rapidly eroding the quality of urban living in what was once a showpiece of coherent urban planning in South Asia. Adhikari (1998) calls this process 'Baneshwarisation'[14] alluding to the example of rampant urban growth in the Baneshwar area in Kathmandu.

The problems resulting from rapid urban growth, haphazard development and general lack of planning have been apparent in the towns of Kathmandu valley for more than three decades. During this period, Kathmandu routinely faced serious deficiency of infrastructure, traffic congestion and inadequacy of housing. These problems were compounded by the continuing damage to the cultural heritage and loss of agricultural land. Now, severe environmental problems are threatening the quality of life in the valley.

The problems of air, water and soil pollution have become critical in the Kathmandu valley, especially in the built-up areas. Because of air pollution, atmospheric visibility has reduced significantly. The number of days with good visibility (greater than 8,000 meters) around noon has decreased in the winter months from more than 25 days per month in the 1970s to about 5 days per month in 1992/93. Particulate pollution is the most significant problem in Kathmandu valley. In 1992/93 TSP (Total

14 By this term the author intends to describe urban neighborhoods as having constrained road access for emergency vehicle, short supply of water, serpentine streets, regular electricity blackouts and voltage fluctuations, seepage from individual septic tanks, tiny residential plots (often as small as 60 sq. m.), large amounts of undisposed solid waste, severe shortage of public facilities, open space, green areas and urban amenities (1998:6-7). This situation, described in the case of Baneshwar, exists in most neighborhoods in Kathmandu.

Suspended Particle) amounted to 16,500 tons and PM10 (particulate material less than 10 micron in diameter) to 4,700 tons. The main sources of particulate pollution are the brick industry (28% PM10 and 31% TSP), domestic fuel combustion (25 % PM10, 14% TSP), Himal cement factory (17 % PM10, 36 % TSP) and resuspension of road dust (9% PM10 and 9 % TSP). WHO air quality guidelines (AQG) for TSP and PM10 are often substantially exceeded. There have been measured 24-hour TSP concentrations above 800 micro-gram/m^3, while the WHO AQG (for daily averages) is 150-230 micro-gram/m^3. About 50% of the population of Kathmandu is exposed to above the upper limit of WHO AQG of TSP (WHO AQG for annual average is 60-90 microgram/m^3) (URBAIR 1996). The impact of air pollution is reflected in the mortality and morbidity rates, in illness patterns and extent, and in decline in tourists. URBAIR (1996) estimates that excess mortality due to PM10 pollution was about 85 cases, in a population of approximately 1 million of the valley. Chronic bronchitis, asthma attacks, and respiratory diseases have increased, due mainly to air pollution. Total loss due to the air pollution was estimated as Rs. 209 million for the year 1992/93 (URBAIR 1996).

The water system in Kathmandu is severely polluted. This pollution is mainly the result of biological contamination rather than the chemical contamination. However, chemical contamination is also growing due to increase in fertilizer and pesticides and industrial expansion. The Bagmati river is the largest river in the valley covering a length of more than 30 km. It is an important source of city water, but has been contaminated to a large extent.[15] Domestic sewage and oxygen demanding wastes, industrial effluents and batteries, and agricultural pollutants like chemicals and nutrients are the main source of the water pollution.

The use of fertilizers and pesticides has grown significantly in recent times, especially for commercial production of vegetables to meet the high demand. It is estimated that about 15% of the chemical fertilizer consumption in Nepal is used in the Kathmandu valley itself (Sharma 1994). Most of the farmers do not use fertilizers in a balanced way. They use mainly nitrogen fertilizers, which increase the acidity of soil, and, in

15 The pollution has reached to such an extent that even the monkeys which live in Pashupati area have been infected with skin disease. Scientists have warned that the water of the river is not useful even for the aquatic life and for irrigation purpose. The water is excessively polluted both chemically and biologically. The main reason for pollution is the sewerage and untreated effluent from carpet/dyeing and washing factories (The Kathmandu Post 1999).

the long run, destroy its physical properties. The leaching of nutrients into the water system also has resulted in the pollution of river system. Similarly, the use of pesticides has increased significantly and DDT, BHC and Thiodane are most commonly used pesticides. Such pesticides accumulate in the produce and enter into the food chain. Even though they are banned even in countries like India, they are extensively used in Nepal. Apart from such inherently dangerous chemicals, the problem with pesticides lies not so much in quantity of use, but in improper use and in negligence in the disposal of containers. Chemical analysis of various crops like wheat and rice in the laboratory has revealed that these crops contain a high amount of poisonous chemicals like DDT and BHC. Similarly vegetables were found to contain Organo-phosphates like Parathion and Fenitrothin (Sharma 1994).

The quality of drinking water in Kathmandu valley is very unsatisfactory and even chlorinated water is found to be contaminated with fecal materials. Over eighty percent of drinking water sample contain a very high count of bacteria, sometimes up to 4800 cells/100 ml. (Jha 1995). In one study, water samples from 5 different treatment plants revealed that 38 % was undrinkable, 22 % contained excessive levels of chlorine and 18 % was polluted by pathogens at the source itself. Thirty-four samples of tap water from representative areas of Kathmandu showed that 72 % was undrinkable A further 16 % did not meet WHO guidelines, and only 12 % was drinkable (see Adhikari 1998:62).

The increased environmental problems as discussed above disproportionately torment the poor. For example, either they now have to buy or treat their water, which drains their already meagre earnings or, more commonly, they drink unsafe water and bear the financial and other costs of resultant disease. Because the poor are often forced to live in the most hazardous and polluted areas of the city, the environmental infrastructure and services that do exist serve them least. Not surprisingly, they also tend to be sick more often than the residents of wealthier areas.

Government statistics show (as discussed later) that the Kathmandu valley has faced food problems since the early 1970s. However, food-supply related problems have a much longer history connected to forms of administration, taxation and generally the burden placed on the poor. Various types of taxes have excessively burdened peasants and town-dwellers, especially during the unification period (1769-1816) and during the Rana regime (1846-1950). During the unification period, peasants also had to shoulder the food requirements of the military and administrative personnel. They also had to provide *corvee* labor (*jhārā* and *begārī*) and

transport military equipment and other supplies within the boundaries of their villages (*hulāk*) (cf. Holmberg et al., this volume). According to Regmi (1999b[1972]:156), King Srinivas Malla (1667-85) of Lalitpur utilized unpaid and compulsory labor for the construction of bridges, battlements and during the war. Similarly, King Jaya Prakash Malla (1736-1768) of Kathmandu exacted such labor for the transportation of saltpeter for his gunpowder factory. The land in Kathmandu valley was granted, from time to time (from before unification through the Rana period) to government employees as *birta* (land grant) and *jāgīr* (land granted as a payment for an employee by the government) and to Brahmans (called *kusaibirtā*). On the other hand, ordinary peasants in the Kathmandu valley had to pay many different types of taxes. In fact most of the cultivators in Kathmandu valley were tenants who paid about 50 % of the produce to the landowners who were mostly the government employees. Peasants aldo had different types of obligations to local government agents which were called *beth*. Kathmandu peasants were taxed more in comparison to peasants in other parts of the country. Peasants had to pay taxes to the royal families, like *walak* (royal palace expenses), *gaddimubarak* (coronation) *chumawan* and *goddhuwa* (for thread wearing ceremony), and *godan* (for funeral ceremony). Similarly peasants were required to pay taxes to the village functionaries during festivals or on ceremonial occasions and after the harvest of crops. Sales taxes of various types were also imposed on peasants and businessmen (see Regmi 1999b[1972]).

Even though peasants and ordinary citizens until the end of Rana rule (1950) were taxed heavily, one does not find a parallel history of use of that money for their welfare. Rather, during the unification period, that money was used for military or expansionist activities, while during the Rana regime (1846-1950) it was used for meeting the expenses of a luxurious life style for the royal and Rana families (Regmi 1978). In comparison, rulers of the distant past are considered much more benevolent toward the people (Bhandari 1990). This is especially so during the Licchavi dynasty (5th-12th century AD) and Malla regime (13th-17th century AD). During the Licchavi period, agricultural production was given special priority and the political system was very much decentralized. Local political units were given rights to use the taxes obtained from the peasants for the welfare of the people. Most of the

rulers were also devotees of the Hindu religion, and accordingly organized welfare programs to gain religious merit.[16]

During the Rana period, the state gave main priority to military and civil servants. As Ranas depended on the military and the bureaucracy for the continuation of their rule, they were concerned to ensure that military and civil servants always had an steady supply of food. Accordingly the first Rana Prime Minister Janga Bahadur (1846) took steps to extract food from peasants in Tarai for the military immediately after his ascendancy to power. In addition, he also supplied food grains for religious ceremonies and to public kitchen houses. He established a 'food store' in Thapathali for this purpose. Food grain was obtained from *guthi* and *raikar* lands. For the effective distribution of food, the 'food store' was kept under the Commander-in-Chief (see Adhikari 1991).

In 1934, an earthquake devastated the valley, destroying about 70 % of the houses (Bhandhari 1990). During that time, a large amount of food was imported from the Tarai to feed the victims of earthquake (Adhikari 1991). While conducting fieldwork in Tokha, an elderly citizen informed us that the village had also received food donations from the government at that time, but this was refused by the community as there was enough food. After the post-earthquake reconstruction, the population in Kathmandu increased. The food demand was thus high in the valley. To meet the demand, government collected every year 2,000 *mund* (800 MT) of rice from Jhapa to Banke districts in the Tarai. In 1948, the government established a 'rice milling and sales company' under the control of military. The Commander-in-Chief was responsible for the distribution of food to the military and to the religious institutions for feeding the needy people. This company provided food to military, police and civil servants on a coupon basis every week. In addition, the company had established two depots (at Hanumandokha and Hattipati in Rani Pokhari) for the sale of rice to general public (Adhikari 1991:1-7).[17] One thus sees a process of extension of extractive polices to feed the valley population. Whereas in earlier periods, it was primarily the valley peasants who bore the brunt of surplus extraction, later the state extended

16 This is not to say that later rulers were not also devotees of Hinduism, nor that state "welfare" activities in the name of religious merit ceased. For an introduction to the post-unification state-monastery power nexus and its deleterious consequences for peasants, see Bouillier 1998.

17 No information was available on the coverage of social/food security programs (including *hunḍī* and public kitchen - discussed later) of the government.

its reach country-wide, with food extraction to supply the Kathmandu valley especially occurring in the Tarai region.

In 1950, after the downfall of Rana regime, the administration was made formally independent from the influence of the military. The government merged the 'food store' and rice milling and sales company into one central rice store. In 1951, the government established a regional food control office and distributed food to people at the rate of the maximum amount of food that could be purchased by Rs. 10 per week per individual. Government personnel were then paid in cash instead of food. In 1951-52, government took a census of the people in the valley who needed to purchase food grain and made a policy of supplying food to these people through the central food control office. There were 32 stores under this office. The government also made arrangements to mill rice in 28 of these stores by the traditional system (i.e., by *ḍhikī* – manual milling of rice). In 1955, the government changed the name of the "regional food control office" to the "food storage and sales department". During these years, government supplied about 2000 MT of rice to the valley every year (Adhikari 1991:1-7).

After the Royal coup and institution of the Panchayat system in 1960, the government instituted a 'valley food arrangement committee' and also allocated to it a budget from government sources. Its functions were confined to the Kathmandu valley. In 1964, government demolished this committee and instituted in its place the Food Arrangement Corporation. In 1966-67, China gave to Nepal 20,000 MT rice to meet food shortages caused by crop failure. This corporation was given the responsibility to distribute the rice. In 1972-73, Nepal faced a severe food crisis due to low rainfall in some places and excessive rainfall in other places. To meet the challenge posed by the bad weather conditions, the government integrated two separate organizations – the Food Arrangement Corporation and the Agricultural Supply Corporation into the Agriculture Purchase and Sales Corporation. This organization took care of the food supply all over the country. Because of lack of efficiency, this was again broken down into the Agricultural Inputs Corporation and the Nepal Food Corporation in 1974. Until now, the latter is responsible for the supply of food to the people from government's side.

Table 1: Kathmandu's Share of Total Foodgrain Sales from Nepal Food Corporation (amount in MT).

Year	Total Foodgrains Distributed by NFC	Kathmandu's Share	Kathmandu's Share (%)
1974/75	24212	16574	68.5
1975/76	26288	15742	59.9
1976/77	32561	11865	36.5
1977/78	34600	18292	52.9
1978/79	29333	18461	62.9
1979/80	46809	24985	53.4
1980/81	50616	26946	53.3
1981/82	36967	18206	49.3
1982/83	71308	31699	44.4
1983/84	50323	22483	44.7
1984/85	39686	20592	51.9
1985-1991	NA	NA	NA
1991/92	53941	25137	42.4
1992/93	88612	20509	23.1
1993/94	111177	32661	29.4
1994/95	70901	32012	45.1
1995/96	76582	43232	56.5
1995-96	50645 (only rice)	37819 (only rice)	74.7
1996-97	50823 (only rice)	23353 (only rice)	45.9
1997/98	69924	34492	49.3

Source: Wallace 1987:25 for up to 1984/85; NFC for 1985/86 - 1995/96 and 1997/98; Gorkhapatra 2054v.s. for 1996/97

Even though the Nepal Food Corporation (NFC) was established to supply food at a subsidized rate to food deficit areas, i.e., mainly hill and mountain districts, the available record shows that a major part of the food has consistently been sold in the Kathmandu valley. This is partly due to the fact that Kathmandu is much more visible in the media (both national and international) and the government tries to cover up the food problem by providing adequate food to Kathmandu dwellers. Moreover, Kathmandu residents have been politically influential and thus able to put pressure on the government. Table 1, which shows the distribution of NFC food in

various years, reveals that Kathmandu has received a disproportionate share of NFC supplied food. NFC's pricing policy has also been biased in favor of Kathmandu. Wallace (1987:13) argues that food distribution prices are lower in Kathmandu than in other areas of the country with similar marketing costs, despite residents' higher incomes and greater access to food supplies then their village counterparts. Regarding the higher incomes in Kathmandu as claimed by Wallace, it may be valid considering the average income, but there are a significant number of urban poor whose income (in cash or kind) is low in absolute terms. The situation prior to 1987 might have been slightly better because of less number of rural poor migrating to urban areas, including Kathmandu. But in the 1990s, the income of a significant population of Kathmandu residents is low.

Even though NFC has distributed proportionately a large amount of food to Kathmandu, it may still be less than required because NFC accounts, as discussed earlier, for only about 15 % of the total rice supplied to the Kathmandu valley. The general public now depends primarily on private sources for their food. This heavy dependence on private sources is also a cause of occasional food shortages in Kathmandu. In 1982 and 1985, business persons artificially created food shortages in Kathmandu in their effort to increase the price (Adhikari 1991). Food shortages in 1985 affected many families, and the price of rice increased from Rs. 9 per kg to Rs. 17 per kg. The situation was brought under control through government intervention, which included checking of the stocks held by business people, and food-aid from foreign countries, but cases of artificially created shortages have been repeated since then as well.

Since mid-July 1998, the government has ceased giving a subsidy to NFC for the transportation of food. Therefore, NFC will charge full price on the food it supplies. This is in line with the policies adopted by Agriculture Perspective Plan (APP – a 20 years program implemented since 1998) which aims to create "perfect competition" in the marketing of food grains in order to give encouragement to farmers. APP has a total commitment to market economy. Thus government intervention in the form of subsidies has been discouraged. On the other hand, it has also formulated some strategies for food security, such as maintaining a food security stock of about 5 % of total food production, and management of this stock by the needy people (APROSC and JMA 1995). For urban poor, APP encourages dairy farming for income which is, in turn, to be utilized for buying food. For increasing food security for the landless,

APP aims at providing employment in farming or non-farm employment in agro-based industries and in business in urban area.

APP is a part of the liberalization and privatization policies adopted by the government since 1990. Accordingly APP emphasizes privatization of production and sales of agricultural inputs, services and removal of subsidies of all kind. The liberalization and privatization policies were first initiated with the implementation of economic stabilization and structural adjustment programs (SAP) in 1985/86 and 1986/87, respectively. In the 1985-87 period, policies were adopted entirely based on the World Bank and the IMF conditions. These policies were forcefully implemented during 1991-94. It is mainly because of SAP that prices have gone up by more than 12 % per year, on average, as compared to 5-6 % yearly during the period 1980-1985. The economic growth rate remained around 4 % during this period in spite of good agricultural production. The poverty level went up to as high as 71 % in 1990 from just 42.44 % in 1985 (Rimal 1996). Thus, a polarization process was evident as manifested in greater hardships for low-income families.

In 1991, the government pursued forcefully the price dictated market policies in line with the World Bank and the IMF. With the initiation of drastic reforms, first of all, partial convertibility in the exchange system was introduced. This was followed by full convertibility in the exchange system. This essentially means that food imported from other countries became more expensive - and in the absence of subsidies, all the more expensive. For strengthening the price dictated market led system, subsidies on fertilizers, essential goods and services were reduced drastically. The tariff rates were also reduced markedly without considering the likely adverse effect on import substituting and small-scale industries. After 1991 also, prices of several public utility services and petroleum products were increased several times. In the name of efficiency, policies like 'labor retrenchment', 'no work no pay' and 'labor contract' were forcefully adopted without adequate facilities to workers fired from their jobs.

A sharp rise in relative prices in the commodity market and decline in wages and other facilities of the workers have led to marked intensification of unemployment and poverty problems in Nepal. During the period from 1991-92, inflation was at a maximum – about 21 % per year. The pressure on prices continued until 1992/93-1993/94 (Rimal 1996:94). The price situation in various years before and after the initiation of liberalization policy of the early 1990s reveal that prices sharply increased

after the liberalization and privatization policy was followed vigorously (CBS 1991, 1998; MOF 1998).

In recent times, the prices of food items have increased to such an extent that ordinary consumers have had to cut the consumption of some vital foods like vegetables and pulses. The vegetable price skyrocketed in 1998 due mainly to the liberalization policy which also includes the devaluation of Nepali currency against the US dollar. Since the Nepali economy is now linked with the global market, particularly the Indian market, the movements of prices in India directly affects consumers in Kathmandu. In Table 2, it is seen that prices of essential commodities have increased tremendously in 1998.

Table 2: Price of Essential Commodities (National Annual Average Price (Rs) of Food Items)

Commodities	Unit	1991	1997	1998
Rice coarse	1 kg	7.70	14.71	15.37
Rice Basmati	1 kg	12.57	23.69	30.00
Rice Mansuli	1 kg	9.09	17.32	22.00
Wheat	1 kg	5.67	10.75	11.49
Wheat Flour	1 kg	7.27	13.60	18.00*
Maize	1 kg	4.76	9.17	11.74
Lentil	1 kg	16.71	37.76	42.00
Potato	1 kg	5.67	10.69	25.00
Tomato	1 kg	12.50	22.23	50.00
Onion	1 kg	10.68	13.67	24.00
Mustard oil	1 lit	47.99	69.44	105.00
Ghee	1 kg	94.12	155.62	167.30
Mutton	1 kg	66.65	120.30	200.00
Buff meat	1 kg	27.36	53.12	100.00
Chicken	1 kg	66.94	113.48	130.00

Source: MOA 1997; * Based on first author's experience

It is seen in Table 2 that market price of vegetables (potato, tomato and onion)[18], and mutton and buff meat increased by more than 100 per

18 Even though the price of vegetables declined slightly in 1999, this kind of rapid increase in prices represents a condition of fluctuating price, which also adversely affect the food security of low-income families. A

cent in a year (1997-1998). The only commodities whose price has increased at normal rate, i.e., according to general inflation level (7 % per annum as per the government's claim), are coarse rice and wheat. The price of seasonal fruits like mango has also gone up significantly. An increase in prices is particularly evident after the presentation of annual budget by the government in the parliament, which usually happens in June. Before the budget speech in 1998, the price of potato was Rs 18 per kg and that of onion was Rs 20 per kg. After the budget speech, the price of these commodities went up to Rs 25 and Rs 22, respectively. Similarly, the price of mustard oil reached Rs 120 per liter from Rs 80.

Apart from these government policies and a disadvantageous international market, unfavorable weather conditions in Nepal and decline in productivity because of lower fertility of soil have been the main causes of increases in the price of food items. Productivity of land has declined due mainly to excessive use of chemical fertilizers and unscientific cultivation practices. John Mellor (American agronomist and the main architect of APP) has said that until two and half decades ago Nepali soil was the most fertile in South Asia. But now it has become the poorest in quality in the whole region (The Kathmandu Post 1998a). Due to insufficient organic manure and excessive dependence on chemical fertilizers, the soil has become hard and has lost its natural water retention properties. Similarly, the problem of Brown Plant Hopper has been severe in Tarai districts. It causes a loss of about 9910 MT of grains annually. Due to unscientific use of pesticides, it has been difficult to control this insect.

The continued effect of liberalization is also evident in recent months. In line with the government's decision to relax restrictions and open up exports, rice is now exported indiscriminately to Bangladesh where the price is slightly higher. The experts have warned that Nepal could face a shortage of rice this year because of the export trend. Similarly, experts have warned that the price of rice could go up tremendously if the government has to purchase it in the international market. At present, NFC controls only about 500,000 quintals of rice (i.e., 5 per cent of the total rice consumed in the country). Private suppliers meet the remaining 95 % of the market demand. Shortage of rice in the hands these private suppliers would mean dire consequences for the consumers (The Kathmandu Post 1998:1). Awareness of these possibilities is reflected in

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wild leap in onion prices in response to the price in India (to over Rs. 100 per kg) is a case in point.

the opinions of the experts and businessmen reported in the press, such as a report predicting that prices of food grains would go up by 70-75 %, and that rice and other food items will have to be imported to meet the local demand in the next few months (The Kathmandu Post 1998b:1).[19]

As there is a large population of laborers in Kathmandu, price hikes, labor retrenchment, low wage rates and removal of subsidy on food (the impact of liberalization and privatization) will definitely affect the food security of its residents. Such impact is already seen in the squatter settlements and the crowded areas of poor neighborhoods in the form nutritional deficiency inflicted on the people. In case study sites, stunted children with big bellies could be seen, especially among migrant workers. Their number will certainly be higher than a visual survey indicates, as the weakest and sickest children cannot be seen in streets or in open or visible places. While conducting fieldwork for this research, womenfolk of migrant workers were also seen collecting young shoots of *sisnu*, nettle (*Urtica dioca*), on roadsides in semi-urban areas like Thimi, Tokha and the like. *Sisnu* is generally eaten in the hills when there is food scarcity. These women are migrants from the hills who work as laborers if the opportunity is available. Similarly, many hill women were seen in vegetable farms in Thimi area collecting vegetable waste, i.e., the parts thrown away while making bundles for the market. These women looked severely undernourished. The employment opportunities for them in Kathmandu, as these women explained, have declined mainly because of decline in the construction of houses. Nowadays, only their husbands work as laborers, and that too occasionally. Similarly, in the wholesale markets (of foodgrain, vegetables and fruits), a crowd of people can always be seen collecting the waste for sale as well as for home consumption. As the purchasing capacity of a large section of society has declined because of price hikes, business opportunities and housing expansion have declined significantly, indicating a recession in the making.

The food security of these laborers is likely to become worse once Nepal obtains membership in World Trade Organization (WTO) which emphasizes a "level" playing field in the sense of imposing tariffs and

19 As expected, the price of basic food stuff did increase after a few months. The rates of increase varied from about 30% to 45%. This increase took place about two weeks after the formation of the new government in June 1999. It was reported in newspapers that this increase was held up by the government until after the elections in order to gain votes.

taxes and in eradicating subsidies. The price of foodgrain in the international market will increase as WTO demands removal of subsidies in agricultural produce. If Nepal's food production does not increase significantly, reducing the need to import essential food commodities, the price to be paid will be extremely high. This will obviously adversely affect the food security of most of the people of the valley, and especially the poorest segment.

The above discussion makes it clear that the government has not implemented effective programs to relieve food security problems. There is also no formal social security system for the unemployed, disabled, sick and old people. On the other hand, the traditional or informal social security system is also on the verge of collapse. Religious attachment and kinship organization and associations were the main institutions that provided (at least some) food security to the most vulnerable households in the past. But the influence of these institutions has drastically declined. In the past, begging for survival and for religious purpose were permitted and people regularly offered alms to such people. Among the closely related persons, food and other help was provided during emergencies. Among the Newars, the existence of common *guṭhī* property and the use of the income from *guṭhī* for religious worships and for feasts would provide an occasional good meal even for the poor households. Even though *guṭhī* are still organized, participation of people has now reduced. While conducting fieldwork in Kathmandu, elderly citizens told us that just a decade ago, all neighbors would help a person building a house. This person would provide only snacks to the helpers. But in the past houses were not built unless necessary for personal residence. In the housing-boom (for rental, resale, etc.) era, this practice of mutual help no longer exists. In the past, regular kitchens were organized in the premises of temples from donations from wealthier and elite families to distribute food to the needy people. Until the late 1950s, there was a system called *hunḍī*[20], under which old persons without children or deserted old persons and disabled persons were given everyday food items like, rice, *dāl* (pulse), salt and *ghee*. This *hunḍī* system was confined to Kathmandu. Even now a few religious institutions (especially around the Pashupatinath temple area) provide some support to needy people. But this is far too little considering the growth in the number of needy people.

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20 Okada and Rana define *hunḍī* as a regular food or cash grant from private, quasi-government and religious charitable organization (1973:1 as cited in Onta-Bhatta 1996).

Implementation of the Land Reform Act of 1964 was another measure aimed at improving the production and economy of people working on land. This program was found initially to have some positive impacts in terms of control of rent and security of land rights for the tenants in Kathmandu valley. It may also initially have had some positive impact on food security among tenant farmers for in the Kathmandu valley alone, fixed maximum rent rates were established in absolute terms rather than as a percentage of the harvest. Official estimates put these rates at about one-third of production (as opposed to a maximum of 50% of the harvest in the rest of the country) (Regmi 1999a[1976]:204-205). The government also introduced a compulsory saving program under which farmers had to save a small part of their production and local political authorities were responsible for its storage. In 1969 this scheme was abandoned, and many farmers did not receive back their foodgrains. Regarding the long-term impact of the Land Reform Act, it created an environment in which landowners were not interested in the production of food because they would receive the same rent even if they made investment in the improvement of production. Malla (1999:10) argues that the establishment of tenant's legal rights to a share of property led to fragmentation and ultimately alienation, dispossession and transfer of land rights to the non-indigenous populations. On the other hand, as Regmi (1999a[1976]:210-11) points out, tenurial security as established through the Land Reform Act is far from secure and may even result in turning a tenant into a landless labourer. Moreover, material improvements can easily revert to the landowner. These and other factors limited the impact of the Land Reform Act on food-security-through-production among tenant farmers.

The above discussion clearly shows that the present period is marked by total lack of formal social security measures from the state and by severe erosion in the traditional or informal security system. Migrant workers in Kathmandu who have been facing hardships due to unemployment also lack social networks. Similarly, the local or indigenous peasants also are not in a better situation with regard to food security. They were heavily burdened with tax and *corvee* labor in the past; in recent times they are haunted by land dispossession.

Research Problem and Methodology

In the light of above problems of food security in Kathmandu valley, the following questions were raised in our research:

- To what extent is the Kathmandu metropolis (valley - see footnote 3) dependent on other geographical areas for the supply of food and what could be the impact of such dependency on food security? What is the contribution of local production in the supply of food in Kathmandu?
- What is the food security situation in the Kathmandu metropolis? What are the determinants of vulnerability of households to food insecurity?
- How have government policies affected the food security situation?

The methodology used for the study involved collection of data and information to reveal macro-level and micro-level situations regarding food security in Kathmandu valley. As the first step, the food supply in the Kathmandu valley was estimated based on food production and distribution statistics from government agencies, NFC and private business persons, and from a traffic survey (of trucks carrying food) at Thankot. This survey enabled us to examine how the urbanization of Kathmandu valley has led to the import of food grains from different parts of the country and from India. Literature was also reviewed to study the temporal changes in the food supply situation and government food distribution policies. Impacts of changes in the economic policies of the government on food security of poorer households have also been studied using information from secondary sources.

As the second step, households were surveyed at different localities (Tokha, Bungmati, Thimi, Anamnagar, Asan-Chettrapati and squatter settlements in Sankhamul and Gulphutar) to examine the food security situations and the strategies adopted to secure the food. Selection of different localities was important because of regional variations in production opportunities and its consequent impact on occupational and income generation patterns. Altogether 201 households were covered. The selected areas ranged from semi-urban areas to the core of the city. Tokha, Bungmati, and Thimi represent semi-urban areas. In each of Bungmati and Tokha, twenty households were surveyed. In Thimi, which is comparatively a larger settlement, 35 households were surveyed. Both are Newar settlements. From the core of the city, Anamnagar and Asan-Chettrapati were studied; the former represents a newly developed neighborhood (residents are mainly immigrants) and the latter an old and traditional city centre neighbourhood (and a major food market). From these two sites, 50 and 31 households, respectively, were surveyed. From the poor neighborhoods, the squatter settlements of Sankhamul (30 households) and Gulphutar (15 households) were surveyed. Before

conducting a household survey in these settlements, oral history in relation to the expansion of settlement, marketing opportunities and food crisis situations (food production, land distribution, food purchase, food sold, poor families facing food crisis, food self-sufficiency) was recorded from elderly citizens (three in each settlement). Households to be surveyed were selected on a purposive basis to represent different classes (based mainly on type of house owned, urban landholding, ownership of vehicle, nature of job and business and ownership of agricultural land).

Food Supply in Kathmandu Valley

Crop production data obtained from government agencies show that Kathmandu valley's production was sufficient to meet the minimum food requirement[21] of its inhabitants until the early 1970s (see Figs. 1-4), even though instances of food importation to feed the military and civil servants is also recorded (discussed below).[22] An estimate made in 1961

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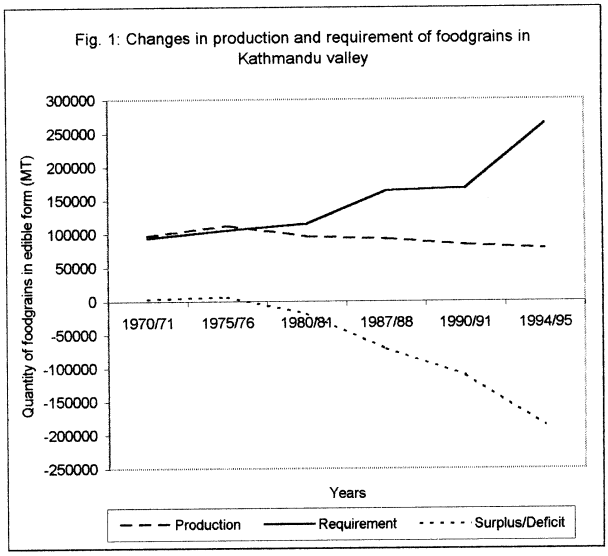
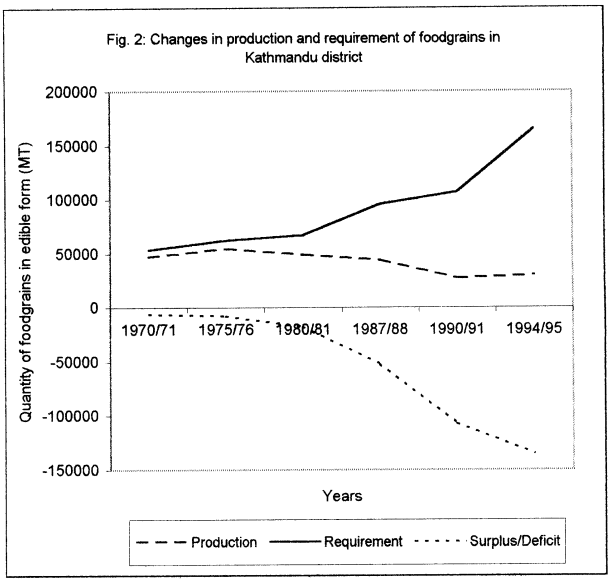
21 Regarding the minimum food requirement a government report states: "The amount of edible foodgrains required per head per annum has been assumed to be 190 kg in case of Tarai region, 160 kg in case of hilly region and 140 kg in case of remote hill areas where food shortage is perpetual" (MOA 1972:79). Regarding foodgrains in edible form, the following assumptions are made for conversion. Total edible foodgrains is computed after deducting seed rate, loss in non-human consumption and milling loss from the total production. The seed rate has been assumed 55 kg/ha for paddy, 30 kg/ha for maize, 66 kg/ha for wheat, 25 kg/ha for buckwheat and 40 kg/ha for oats. Non-human consumption includes feed for cattle and other domestic animals and birds, and loss due to insects and pests. 10 % of the foodgrain is lost in non-human consumption. Regarding milling loss, 40 % will be lost in dehusking of rice and 3 % will be lost in milling of other foodgrains like maize, wheat and millet. In the *Agricultural Marketing Information Bulletin* the food requirement in Kathmandu valley (three districts) has been calculated based on the assumption that 200 kg of edible food (cereals) is required per person per year. In terms of calories, the assumption made in this report is 2054 Calories per person per day. For other years, it has been assumed as 160 kg per capita per year (MOA 1996:99-103). Source for all figures: MOA 1972, 1996; MFAI 1976; CBS 1989.

22 Royal families and other elite used to bring quality food from different parts of the country to suit their taste. As an example, Acharya (1989) mentions that King Rana Bahadur Shah reconfirmed the Jirel people's *kipaṭ* in 1795 under the condition that the *kipaṭ* owners fulfill compulsary obligations to the state by taking care of royal herds located in Jiri river valley. In two royal *goṭhs*, there were 10,000 to 12,000 cows and buffaloes. The Jirels had to supply clarified butter to royal kitchen on





stipulated dates. Similar obligations were put to the people of other places known for their particular products. For a more recent Tamang example see Holmberg et al., this volume.

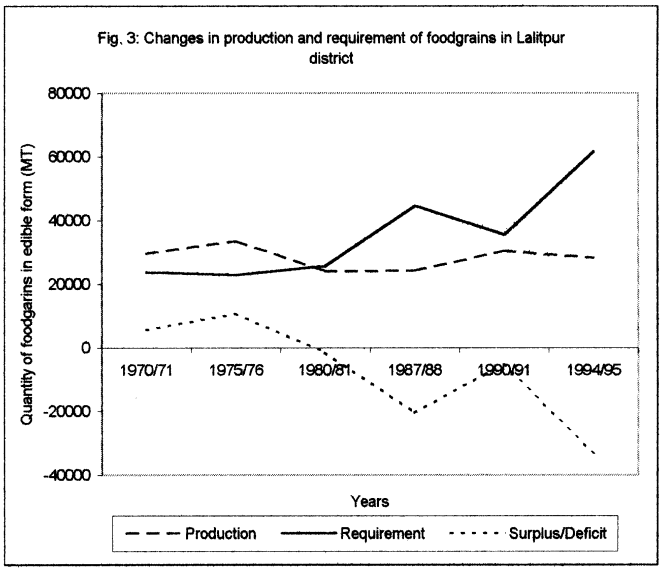


Fig. 3: Changes in production and requirement of foodgrains in Lalitpur district
80000
60000
40000
20000
0
-20000
-40000
Quantity of foodgarins in edible form (MT)
1970/71
1975/76
1980/81
1987/88
1990/91
1994/95
Years
Production
Requirement
Surplus/Deficit

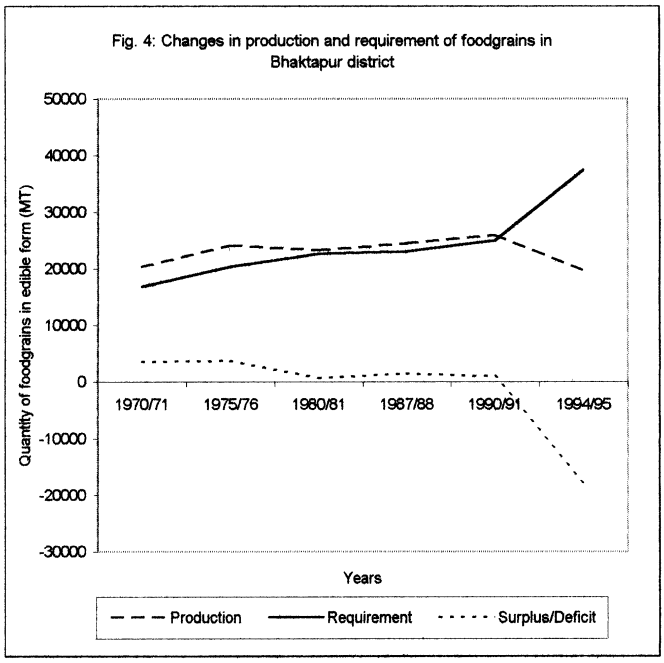


Fig. 4: Changes in production and requirement of foodgrains in Bhaktapur district
50000
40000
30000
20000
10000
0
-10000
-20000
-30000
Quantity of foodgrains in edible form (MT)
1970/71
1975/76
1980/81
1987/88
1990/91
1994/95
Years
Production
Requirement
Surplus/Deficit

based on total population in relation to cereals available showed that there existed a deficit of 7.9 % for the Kathmandu valley (Gurung 1989:213). Whether it began in the 1960s or 1970s, the deficit grew drastically from 1975. In 1975 (population = 660,000), the valley had a slight surplus (6650 MT) in food production. By 1987/88 (population = 1,022,000), the deficit in food production in the Kathmandu valley reached to about 100,000 MT. The deficit almost doubled, amounting to 200,000 MT by 1994/95 (population = 1,319,000). However, the situation in Kathmandu district itself was slightly different. This district faced food deficit since the 1960s, but the extent of deficit remained very low until the mid-1970s. This is obvious from the fact that built-up areas were more concentrated in Kathmandu district as compared to other two districts, particularly Bhaktapur district. The food self-sufficiency situation seemed slightly better in Lalitpur district, which has faced deficit production only since the 1980s. But the trend of deficit or surplus food production is variable, mainly because of differences in population pressure (Fig. 3). As the Bhaktapur district contained a large tract of farmland, its food self-sufficiency situations looked better. It had slight surplus until 1990 and then faced deficit production (Fig. 4).

Supply of Foodgrains to Kathmandu Valley

To meet the deficit in food production, the Kathmandu valley started to import food from outside. Initially, during the 1970s and early 1980s, food was being supplied from the Tarai region. As the Tarai region's productivity was strained due to decline in productivity of land, Nepal slowly switched its overall position from a net exporter of grain to a net importer of grain from other countries. The overall agricultural production grew in the country as a whole at a rate of –0.2 % in the decades of 1980s and 1990s (APROSC and JMA 1995). The impact of this situation is that Kathmandu started to depend on the Indian market for food items, especially cereals and fruits.

Analysis of the food supply situation in Kathmandu in the late 1990s shows that Kathmandu is heavily dependent on north India for food (cereals, pulses, oil, and fruits). Food is supplied to Kathmandu through two main sources – from government agencies and from private (business persons) sources. As discussed above, the NFC is responsible for the supply of food to Kathmandu and other districts from the government's side. This corporation imports food from grain surplus areas in the Tarai, and from foreign countries (mainly India). So long as the corporation subsidized the transportation cost, food supplied from NFC was slightly

cheaper. In Kathmandu, the difference in the price of rice supplied through NFC and that through private suppliers was found to be approx. Rs 1 per kg in 1998.

Data collected from NFC and private suppliers revealed that in 1996/97, 142,102 MT of rice was supplied to the Kathmandu valley. Of this rice, just 15.5 % was supplied by NFC and the rest (84.5 %) was supplied through the private sources.[23] Of this total rice, 34.5 % was Tarai (Nepal) rice and 65.5 % Indian rice (see also Maps 1 and 3). The total rice production in the Kathmandu valley in that year was 23,263 MT. Accordingly the total rice consumed in Kathmandu valley comes to about 165,365 MT. The internal production of the Kathmandu valley, thus, could meet only 14 % of consumption.[24]

The collected data also showed that about 59 % of the rice supplied by NFC was of Nepali (Tarai) origin while the rest was Indian rice. But of the total rice supplied by business persons, 70 % was Indian rice and the rest was Nepali (Tarai) rice. NFC collects rice mainly from market centres (Lahan, Itahari, Biratnagar) of the eastern Tarai, which is considered relatively developed with more infrastructural facilities like irrigation and roads. Other areas from which NFC imported rice in 1996/97 for distribution in Kathmandu included Nepalgunj, Birgunj, Bhairahawa, Dhanagari, Rajapur, Janakpur, Tikapur and Mahendranagar (see Map 2).

Apart from rice, other food items like wheat flour, pulses, oil and sugar are also supplied to Kathmandu valley mainly from outside. The information obtained from NFC and main wholesalers indicates that Kathmandu consumed 240,783 MT of these food items (rice, wheat flour, pulses, oil and sugar). Of this amount, 24 % was supplied from the Tarai, 66 % imported from India, and 10 % was produced within the valley.

The wholesalers of Kuleshwar are responsible for the import of foodgrains. They supply to other semi-wholesalers or retailers by diverting the trucks coming from the Tarai or India directly to them. The semi-wholesalers are located mainly in Balaju and in Kalimati. The main wholesalers are of Indian origin or belong to Marwari group. It is said that they control 95 % of the food merchandise. Interviews were taken from a sample of these people to collect information about the supply of food

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23 NFC also supplied an insignificant amount of wheat flour. All other foodgrains are supplied primarily through private source and are brought mainly from India (see Map 3).

24 Source of figures: Internal progress report of NFC, 1996/97 and survey with main wholesalers.

items from private sources. From the survey, it was also revealed that about 50% of food items (rice, pulse and wheat flour) traded by them are consumed (or at least sold) within Kathmandu city, and the rest is supplied to Patan and Bhaktapur cities and to Banepa town.

Supply of Fruits to Kathmandu Valley

As the number of wealthy people has increased due to immigration from other parts of the country, Kathmandu now requires a large quantity of fruits to cater to their needs. The fruits consumed in Kathmandu are largely supplied from India. Information collected from the wholesalers' association in Kuleshwar revealed that approximately 2668 trucks entered Kathmandu in 1997 with various types of fruits. Assuming that one truck carries 9 MT, 24,012 MT fruits were supplied to Kathmandu from various parts of India. Only a small proportion of oranges, litchi and sugarcane was supplied to Kathmandu from various parts of the hills and Tarai of Nepal. About 50% of this imported fruit was retained in Kathmandu district, 20 % in Bhaktapur district and 15 % in Lalitpur district. About 15 % were supplied to other parts of the country and to Khasa, Tibet (Map 4).

Supply of Vegetables to Kathmandu Valley

Despite a significant amount of vegetable production within the valley, the local produce is just insignificant to meet the requirement. Accordingly, a large quantity of vegetables are imported to Kathmandu. It is estimated that 166,095 MT of vegetables were sold in Kathmandu valley in 1994/95, of which 81% was supplied from other districts of Nepal, 14% was imported from India and 5 % was local produce (estimated from MOA 1996:46-62; see Map 5).

Traffic Survey (of trucks entering Kathmandu) at Thankot

Traffic (trucks and vans) flow entering the valley was recorded for one day[25] from Metropolitan Custom Office at Gurjudhara near Thankot, the main entrance to the valley. This office checks the means of transport and

25 As the informant reported that there is not much day-to-day variation in summer season, it was assumed that data on any random day would give a rough indication about the flow of traffic. There is, however, a wide difference in traffic flow between a summer and a winter day.

the goods carried in order to impose taxes. Information about the traffic flow was collected on 11 July 1998. On that day, 303 loaded trucks and tankers entered the valley. Of them, 89 (i.e., 30%) carried food items, as follows: 37.1 % carried rice, 10.1 % paddy, 6.7 % beaten rice, 23.6 % flour, 1.1 % pulses, 15.7 % fruits, 1.1 % oilseeds, 1.1 % maize and 3.4 % vegetables (Table 3). The officials were also asked their opinion on the seasonal variation in the entrance of various food items. Officials reported that the traffic flow increases from October to April. In these months, the officials say that as many as 500-600 trucks enter the valley. Assuming a constant rate of importation, with 30 % of trucks carrying foodstuffs, 150-200 trucks would carry food everyday in the months October-April. Assuming that a truck carries 9 MT of food (maximum capacity is 10 MT), 1350-1800 MT of food enter the valley daily during the seven dry months of the year while, taking our sample day as representative, 801 MT of food enter the valley daily during the remaining five months.

If, as indicated by this survey and customs officials' statements, for 5 months of the year about 90 trucks carry food daily while during the remaining 7 months 175 trucks, on average, carry foodstuff, the annual average would be 140 trucks carrying foodstuff entering the valley each day. Assuming that the composition of the loads remain constant throughout the year, 37.1 % of the total trucks would carry rice, giving a total of 466 MT (1 truck = 9 MT) of rice entering the Kathmandu valley every day. For the whole year, the amount of rice supplied to the valley would be 167,760 MT. As discussed earlier, a similar estimate (142,102 MT of rice supplied to Kathmandu valley in 1996/97) was made on the basis of NFC data and a survey of private sources (wholesalers). The estimates made from these two methods seem to coincide given the fact that a small proportion of food entering into Kathmandu valley also goes to Khasa and to food deficit areas in Kavrepalanchok and Sindhupalchok districts. Moreover, the volume of rice consumed in Kathmandu might have slightly increased in 1997/98 over 1996/97. A small amount of food enters Kathmandu from the hills (of Nepal) through Sankhu and through Trisuli, but its volume is negligible as compared to that entering from Thankot.

Table 3: Trucks with food items entering Kathmandu Valley on 11 July 1998 (27 Asar 2055 v.s.)

Type of Food	Number of Trucks	Origin Point	Destination in valley
Rice	33 (37.1%)	Jhapa, Bhairahawa, Birgunj	Kathmandu (26 T), Bode (1 T), Barabise (2 T)**, Chapagaon (1 T), Banepa (1 T), Panauti (1 T), Sanepa (1 T)
Paddy	9 (10.1%)	Gitanagar, Birgunj, Bailbas, Chainpur, Lahan, Janakpur, Haripur	Bhaktapur (3 T), Thimi (2 T), Kathmandu (4T)
Beaten rice	6 (6.7%)	Parasi, Bhairahawa, Narayanghat	Barabise (2 T), Bhaktapur (2 T), Kathmandu (2 T)
Flour (Maida)	21 (23.6%)	Hetauda (3 T), Janakpur (2 T), Birgunj (2 T), Nepalgunj (1 T), Bhairahawa (13 T)	Banepa (1 T), Kathmandu (20 T), Balaju, Koteshwar, Chabahil, Balkhu
Pulses	1 (1.1 %)	Narayanghat	Kalimati
Fruits	14 (15.7%)		
Banana	5	Naughachiya* (1T), Hanjipur* (2T), Naugada* (2T)	Kuleshwar (5 T)
Mango	6	Delhi (2T)*, Sunauli* (2T), Krishnanagar (2T), Lakhnow* (1T)	Kuleshwa r (6 T)
Lemon	1	Lakhnow* (1T)	Kalimati (1T)
Jack-fruit	1	Narayanghat (1T)	Kathmandu (1T)
Others	1	Sunauli* (1T)	Balkhu (1 T)
Oilseeds	1 (1.1%)	Rautahat (1 T)	Patan (1T)
Maize	1 (1.1%)	Birgunj (1 T)	Balaju (1T)
Vegetables	3 (3.4 %)	Palung (1T), Lauki (1T), Gaur (1T)	Balkhu (1T), Kalimati (1T)
Total	89 (100.0%)		

*Place in India. ** Outside Kathmandu valley. T = Truck, 1 truck carries approx. 9 MT. Source: Kathmandu Metropolitan Custom Office, Gurjudhara

Food Security in Kathmandu Valley: Evidence from Case Studies

Analysis at the Community Level

From the analysis of data obtained from the household survey, Kathmandu is revealed to be a city facing a deep problem of food insecurity. A large proportion of inhabitants were found to have no access to adequate food. When considered in terms of human capability, food security was found to be markedly inadequate. The incidence of health problems was higher among the centre city dwellers than the inhabitants of peripheral areas (see Table 4). The proportion of households having chronically sick member(s) ranged from 4 % to 42 %. The communities (e.g., Anamnagar, Thimi) which were relatively affluent, with higher education and access to white collar jobs, were found to be in better health (due to better nutrition and sanitation). Similarly a community (Bungmati) with higher non-farm income but with some support from subsistence production was also found to have better health conditions. Despite higher income and large support from subsistence production, health conditions in Tokha was not better than that in Bungmati. The probable reason lies in the sanitation conditions. Until 5 years ago, Tokha was very dirty. Even the local residents described it as the dirtiest community in the Kathmandu valley. After 3 years (1995-1997) of sanitation and drainage improvement and street pavement done by Plan International, the community looked somewhat cleaner. Nonetheless, most of the residents were having stomach problems.

Different communities were found to spend from 50% to about 80% of their average income on food alone. The most common complaint of the consumers was the rapid increase in price and deterioration in the quality of food items available in the market. The major change that was noticed by the city dwellers regarding food is that they used to prepare most of the food at home in the past, but now buy ready-made foods, at least for breakfast and snacks. The income, expenditure on food and food consumption level in different communities studied have been summarized in Table 4.

In Table 4, it is seen that food consumption is slightly higher than the minimum requirements in semi-urban areas like Tokha, Bungmati and Thimi (predominantly Newar communities). This is partly related to their access to land, or partial self-sufficiency in food production. Food self-sufficiency is higher in Tokha, but its income (i.e., cash income) is also lower. From this low income residents must provide whatever they can

not produce at home. As a result, they spent a higher level of their income on food.

Bungmati is somewhat closer to urban centers in its profile, in comparison to Tokha. It has a smaller family size and low level of food self-sufficiency as compared to Tokha. Food consumption is slightly lower than in Tokha. Bungmati being a tourist center, some efforts have been made to keep the community clean. On average about 49% of cash income was found to be spent on food.

Table 4: Socio-economic and food security features in case study sites in Kathmandu Valley (1998)

	Tokha (n=20)	Bungmati (n=20)	Thimi (n=35)	Anamnagar (n=50)	Chettrapati (n=31)	Squatter (n=45)
Food self-sufficiency – months*	8	5.7	3.5	0	0	0
Family size (members)	8.3	6.1	7.6	5.3	6.6	5.3
Family Education Index[26]	0.7	0.9	1.0	1.9	1.5	0.5
Total family income (Rs)	33,564	33,440	64,097	83,576	75,477	33,053
Expenses on food (Rs)	18347	16598	23642	30816	35910	21226
Cereal consumption (kg/capita)**	201.9	185.1	182.4	122.9	118.2	114.6
% of total income spent on food	75.4	48.9	46.0	49.0	61.0	77.0
% households with chronically sick member(s)	30	15	15	4	35	42

Source: Field Survey, 1998; * Number of months in a year in which food produced at home is sufficient to feed the family; ** should be compared with requirement which is assumed as 180 kg per capita per year.

26 Family education level has been calculated giving weight to the educational level of each member and then averages have been calculated by dividing the total score with the family size. The weight given was 5 for MA and above, 4 for BA, 3 for IA, 2 for high school graduate and 1 for literate and under high school and 0 for illiterate.

Thimi is a community, which, even though considered to be a fully urbanized area (declared as a municipality), still shows some rural characteristics. On average, food self-sufficiency in the community is about 3.5 months. Family education is also slightly better there in comparison to Tokha and Bungmati. Income level is almost double that in Tokha and Bungmati. But this income is mainly cash income, whereas Tokha and Bungmati have access to non-cash income. Food consumption is slightly lower than in the two semi-urban communities, but is above the minimum requirement (180 kg). On average, 46 % of the income is spent on food.

Chettrapati-Asan area represents the urban core area, a traditional business center. It has been dominated by Newars who had their own traditional business. Some of the extended families have migrated elsewhere to other business centers. It is seen in Table 4 that educational attainment is significantly higher here than in Thimi, Bungmati or Tokha. One of the reasons for larger family size here is the impact of the past joint-family system, which was common among traditional Newar families. Income level in this area is also higher. About 61 per cent of income was spent on food. This expenditure on food should be examined in the context that residents of the community do not grow or produce anything. They buy all foods they require. One of the reasons for lower cereal consumption (and higher food costs) here is that people consume here not only traditional food items like rice and flour, but also many ready-made foods like bread, biscuits and noodles. It was also reported that children and jobholders take at least snacks or lunch at the schools or offices. This would have reduced the food consumed at home, whereas questions asked were mainly concerned with consumption of main food items (rice and wheat flour) at home.

Anamnagar, a newly developed urban residential center, shows similarities with Chettrapati-Asan area with regard to amount of food consumed. But the level of education and income is higher here. Most of the residents are migrants from other parts of the country, and are dependent on salaried positions for their income. They occupy, in most of the cases, high positions in their organization. Accordingly, their income was also high. The educational attainment of residents of this community is also very high. Yet the cereal consumption here is estimated to be lower than the requirements. But the residents also reported that they consume ready-made food and snacks in office. Accordingly, the estimation seems to be under-stated. Rather, what may be indicated is a change in consumption patterns among wealthier urban households. Only

2 of the 50 families interviewed reported that they have chronically sick members. Anamnagar is very diverse in terms of ethnic composition. Brahmins, Chettris, Gurungs and Rais predominate.

Not surprisingly, the food problem was found to be severe in squatter settlements. Residents of these settlements not only consumed less food than the requirements, but also spent as much as 78 % of their income on food alone. In this case it is seen that food consumption is accurately reflected by the survey, for they can not afford to buy other food except common staples like rice and wheat flour. In areas like Chettrapati or Anamnagar, it is seen that there is enough marginal income to buy the ready-made foods. In fact expenditure on food, in absolute term, is lower (by about 31%) in squatter settlements than in Anamnagar even though they both have similar family size. On the other hand, per capita consumption of basic foodstuffs is only slightly different in these two communities. Educational attainment was found to be lowest in the squatter settlement.

The problem of food crisis in squatter settlements is also evident from the endemic sickness reported here. About 40 % households (20 people in 19 families) here were found to have chronically ill members. This illness was the result of three main causes: lower food consumption, hard work, and exposure to unhygienic or polluted environment both at home and at work. Most of the jobholders of the community are involved in driving or in factory work, informal trading like keeping teashops at road intersections and bus stops, *ṭhelā* (pushcart) pushing and vending in the streets. Such work constantly exposes them to the polluted environment. The diseases affecting the residents include TB (1 case), heart problems (5 cases), lung problems (2 cases), paralysis (3 cases), birth defects (2 cases), mental problems (1 case), back-pain (2 cases), diabetes (1 case) and stomach problems (3 cases). In other settlements or communities studied, there were also cases of chronically ill members, but here the extent of sickness is higher, the diseases are of serious nature and relatively young people are suffering from them. In other communities, the common problems reported are gastritis, skin problem and heart problem, and generally old persons are affected.

Diversity within case study sites

Despite differences in overall risk among different case study sites, it is observed that potentially food insecure households exist in all of them. This is revealed when the data are disaggregated. In Table 5, households are categorized according to their food consumption level (in relation to

Table 5: Level of food consumption in various settlements (1998) in Kathmandu Valley (number of households)

% of food requirement met*	Tokha (n=20)	Bung-mati (n=20)	Thimi (n=35)	Anamnagar (n=50)	Asan-Che-ttrapati (n=31)	Squatter Settlement (n=45)
Less than 50	-	-	-	9 (17.6)	5 (14.2)	4 (8.8)
50 – 60	-	-	-	11 (21.5)	10 (28.5)	12 (28.8)
60 – 70	1 (5.0)	1 (5.0)	-	9 (17.6)	9 (26.7)	13 (28.8)
70 – 80	2 (10.0)	2 (10.0)	9 (25.7)	10 (19.6)	2 (5.7)	4 (8.8)
80 – 90	2 (10.0)	2 (10.0)	5 (14.2)	1 (1.9)	2 (5.7)	9 (20.0)
90 – 100	4 (20.0)	3 (15.0)	6 (17.1)	8 (15.6)	2 (5.7)	2 (4.4)
100 – 110	-	4 (20.0)	2 (5.7)	2 (3.9)	-	-
100 – 120	4 (20.0)	4 (20.0)	6 (17.1)	-	-	-
More than 120	6 (30.0)	3 (15.0)	7 (20.0)	-	1 (2.8)	-

Source: Field Survey, 1998; * considering 180 kg per capita per year as the minimum requirement. Figures in brackets are percentages.

minimum requirements). Here it is seen that settlements having some access to food production opportunities have consumed more food. For example, in Tokha and Bungmati, 50 % and 45 % of households, respectively, were found to consume less than the minimum requirement of foodgrains. In Thimi, this proportion was slightly higher (57 %). But in fully urbanized settlements overwhelming proportions of households were found to have consumed less than the requirements. For example, in Anamnagar, only 4 % of households were found to consume enough basic foodgrains. The figure in Asan-Chettrapati was 3 %. In squatter settlements only 4 % households were found to consume sufficient food. But this low level of consumption in fully urbanized areas was also evident because of difficulty in estimating the percentage of food consumed at home. Because of the nature of occupation (job, business, students and frequent travelling) undertaken by families in these settlements, main staple food purchased at home was comparatively low. The only possible way to estimate food consumption in these settlements is to examine the nutritional capabilities. As stated above, there is comparatively less incidence of diseases in fully urbanized settlements (Anamnagar and Asan-Chettrapati). Moreover, expenditure on food is comparatively less in these communities in relation to their income. In squatter settlements, on the other hand, a higher proportion of income is

spent on food, and families are also affected by chronic diseases at a higher rate.

Determinants of Food Security

Considering the variation within each settlement in the ability of households to secure food, an attempt has been made to relate the food consumption level with various socio-economic factors. The factors that were considered are income level, food self-sufficiency, family size, family education, the number of chronically sick persons in the family and the number of dependent members (age group of below 15 years and above 60 years) in the family.

The analysis shows a distinct and different pattern for settlements having opportunities for food production (Tokha, Bungmati and Thimi), for fully urbanized settlements (Anamnagar and Asan-Chettrapati) and for squatter settlements. In the former case, only food self-sufficiency was found to consistently increase along with increase in the level of food consumption (in relation to minimum requirements). Other factors do not show any consistent pattern in relation to food consumption. The only exception here is seen among the groups with high surplus consumption.

Table 6: Food consumption and socio-economic factors in Tokha village (1998)

% of food requirement met*	House-holds	Family education#	Family size (members)	Sick mem-bers	Depen-dent mem-bers	FSS@ (months)	Yearly income (Rs)
60 – 70	1 (5.0)	0.8	9	1	4	7	61080
70 – 80	3 (15.0)	1.4	11.6	0.6	4	7.6	32,700
80 – 90	2 (10.0)	0.5	7.5	1	1.75	5.5	76,250
90 – 100	4 (20.0)	0.5	8.5	0.5	3	7.7	20,750
110 – 120	4 (20.0)	0.4	9.3	0	4.3	8.3	25,360
More than 120	6 (30.0)	0.81	6.3	0	2.7	11.6	29,814

Source: Field Survey, 1998; * considering 180 kg per capita per year as the minimum requirement. Figures in brackets are percentages. # Education Index as discussed in footnote 26. @ Food self-sufficiency (number of months in a year in which food produced at home is sufficient to feed the family).

Table 7: Food consumption and socio-economic factors in Bungmati village (1998)

% food requirement met*	House-Holds	Family education#	Family size (members)	Sick members	Dependent members	FSS@ (months)	Yearly income (Rs)
60 – 70	1 (5.0)	0.2	16	0	8	0	72,000
70 – 80	2 (10)	0.4	6.5	0	2.7	3.5	29,200
80 – 90	3 (15.0)	1	7	0	2.7	6.3	40,133
90 – 100	3 (15.0)	0.9	4.3	0.3	1.2	10.3	34,300
100 – 110	4 (20.0)	0.9	4.7	0.3	0.8	9.7	22,189
110 – 120	4 (20.0)	0.9	6.7	0.2	2.1	12	33,000
More than 120	3 (15.)	1.25	4.5	0	1.6	8	31,950

Source: Field Survey, 1998; * considering 180 kg per capita per year as the minimum requirement. Figures in brackets are percentages. # Education Index as discussed in footnote 26. @ Food self-sufficiency (number of months in a year in which food produced at home is sufficient to feed the family).

Table 8: Food consumption and socio-economic factors in Thimi village (1998)

% food requirement met*	House-Holds	Family education#	Family size (members)	Sick members	Dependent members	FSS@ (months)	Yearly income (Rs)
70 – 80	9 (17.6)	1.3	7.9	0.1	2.8	0.8	84,267
80 – 90	5 (14.5)	1.1	10.6	.4	4.4	3.2	85,400
90 – 100	6 (17.1)	1	6.8	0.2	2.5	2.5	51,833
100 – 110	6 (17.1)	0.5	8	1	2.3	6	39,000
110 – 120	6 (17.1)	1	7.5	0	3.4	6.5	63,333
More than 120	5 (14.5)	0.67	5.8	0	2.3	5	41,285

Source: Field Survey, 1998; * considering 180 kg per capita per year as the minimum requirement. Figures in brackets are percentages. # Education Index as discussed in footnote 26. @ Food self-sufficiency (number of months in a year in which food produced at home is sufficient to feed the family).

In all three settlements, this group (families with high surplus consumption) tends to have small family size, high education, no chronically sick members and fewer dependent members. In other groups (or food consumption levels) it is the total mix of all above mentioned factors that has affected the consumption level. This is illustrated in Tables 6-8.

In Anamnagar, which represents a newly developed neighborhood where families are dependent mainly on white-collar jobs, it is seen that education is directly related with the consumption level (Table 9). Education increases consistently from lower food consumption level to higher food consumption level. Similarly, family size and number of sick and dependent member tend to decline as the food consumption level increases. But this relationship was not found to be as direct as was the case with education. Nor does income level show a direct relationship with consumption level. Families with low income have also brought their consumption to a higher level by maintaining a small family size with no (or fewer) sick and dependent members.

Table 9: Food consumption and socio-economic factors in Anamnagar (1998)

% of food requirement met*	House-holds	Fam-ily educat ion#	Fam-ily size (mem bers)	Sick mem-bers	Depen dent mem-bers	FSS@ (mon-ths)	Yearly income (Rs)
Less than 50	9 (17.6)	1.6	8	0.3	3.4	0	93,551
50 – 60	11 (21.5)	1.7	5.6	0	1.9	0	83,085
60 – 70	9 (17.6)	1.8	5.8	0.2	2.4	0	107,000
70 – 80	10 (19.6)	1.8	4.7	0	1.6	0	65,118
80 – 90	1 (2.0)	1.3	3	0	1	0	36,480
90 – 100	8 (15.6)	2.6	3.1	0	0.4	0	55,062
100 – 110	2 (3.9)	2.6	4	0	0.2	0	174,840

Source: Field Survey, 1998; * considering 180 kg per capita per year as the minimum requirement. Figures in brackets are percentages. # Education Index as discussed in foot note 26. @ Food self-sufficiency (number of months in a year in which food produced at home is sufficient to feed the family).

Asan-Chettrapati represents a business center, where families are engaged in business as well as in jobs. Unlike in Anamnagar, here education level does not show a direct relationship with consumption level. On the other hand, family size and dependency load shows a tendency to decrease as the consumption level increases, with a few exceptions. The load of dependent members has been reduced only if the family has very large income (e.g., the group with highest consumption level in Table 10).

In the case of squatter settlements where employment in the informal sector provides livelihood, no definite pattern of determinants can be sorted out. As seen in Table 11, it is the mixed effect of all factors that seem to determine the consumption level. Even though these households have small family size, a large proportion of family members are affected by chronic illness. Moreover, most of them are unskilled or semi-skilled workers. As a result they earn less.

Table 10: Food consumption and socio-economic factors in Asan-Chettrapati (1998)

% food requirement met*	House-Holds	Fam-ily educat ion#	Fam-ily size (mem bers)	Sick mem-bers	Depen dent mem-bers	FSS@ (mon-ths)	Yearly income (Rs)
Less than 50	5 (13.8)	1.5	8.8	0.5	4	0	54,000
50-60	10 (28.5)	1.3	7.9	0.6	3.1	0	91,000
60 – 70	9 (26.7)	1.7	5.2	0.3	1.2	0	57,347
70 – 80	2 (5.7)	1.6	7	0	3.3	0	48,000
80 – 90	2 (5.7)	1.5	4	0	2	0	132,000
90 – 100	2 (5.7)	1.4	3	0.5	0.8	0	39,900
More than 120	1 (2.8)	3.8	9	2	1	0	360,000

Source: Field Survey, 1998; * considering 180 kg per capita per year as the minimum requirement. Figures in brackets are percentages. # Education Index as discussed in footnote 26. @ Food self-sufficiency (number of months in a year in which food produced at home is sufficient to feed the family).

Table 11: Food consumption and socio-economic factors in squatter settlement (1998)

% food requirement met*	House-Holds	Family education#	Family size (members)	Sick members	Dependent members	FSS@ (months)	Yearly income (Rs)
Less than 50	4 (8.8)	0.5	6.7	0	3.7	0	19,250
50 – 60	13 (28.8)	0.5	4.9	0.4	2.2	0	32,200
60 – 70	13 (28.8)	0.5	5.7	0.7	2.3	0	29,778
70 – 80	4 (8.8)	0.8	4	0.5	1.5	0	24,500
80 – 90	9 (20.0)	0.6	5.6	0.2	2.3	0	48,822
90 – 100	2 (4.4)	0.5	3.0	0	1.0	0	34,000

Source: Field Survey, 1998. * considering 180 kg per capita per year as the minimum requirement. Figures in brackets are percentages. # Education Index as discussed in footnote 26. @ Food self-sufficiency (number of months in a year in which food produced at home is sufficient to feed the family).

In all settlements, a large proportion of families depend on a wide range of activities to augment their food consumption. But there is also variation from settlement to settlement in this regard. In Anamnagar a large number of households were dependent on wage income (mainly white-collar) and, to a lesser extent, on business. The reverse was the situation in Asan-Chettrapati area. In this settlement, another source of income was house rent. These settlements (Anamnagar and Asan-Chettrapati) are thus dependent on education, modern skills and capital for the livelihoods of their residents.

The occupational structure of Tokha, Bungmati and Thimi was quite different than in other settlements. In these settlements, there exist some opportunities for food production. But as discussed earlier only a very small proportion of households can fulfill their total food requirements from farming. For all others, farming provides a partial support for meeting food requirements. This home produced food is sold in the market and then cheaper rice is purchased for consumption. To fulfill the food deficit and to earn cash income, people of these settlements have utilized their traditional skills. Residents of Tokha work in Kathmandu and in

other towns as masons and as skilled house builders (brick laying, cement and concrete related work). Almost every household has members who perform these tasks. Most of them commute to Kathmandu for such work. Only a few stay in other towns. In case of Bungmati, woodcarving and carpentry have been the traditional skills. About 45 % households have business related to woodcarving and carpentry. A few others work on a daily wage basis as carpenters. These traditional skills (learned at home) have also helped a few residents of these settlements to find jobs in Gulf countries. In the case of Thimi, vegetable farming and pottery are the traditional skills. These skills have provided income-earning opportunities for the residents of Thimi. Job in government or in private organizations are another source of income, but for only a few households. In these settlements, families were also found to keep some livestock, mainly buffaloes and goats, earning a small part of income from livestock also.

In the squatter settlements, a wide array of activities were undertaken to maintain livelihood. They include manual laboring in construction sites, hotels and garment factories, driving (mainly tempos), selling tea at road junctions and bus-stops, *ṭhelā* (push-cart) pushing, mobile trading, producing woolen thread for carpet factories, tailoring and masonry. Each and every household combines at least two or more of these activities to maximally utilize family labor and skill (or to take advantage of whatever chances for income generation the labour market provides at a given time).

In sum, the empirical information collected from this micro-level study reveals that there exists a considerable problem of food insecurity across a range of communities. Despite this situation, the government has not yet provided any formal support for the families suffering from food insecurity. What steps have been taken by the government (as discussed in the preceding section), seem too little, too late. Moreover, the government's recent policies (discussed above) have adversely affected the food security of poor families.

Conclusions

This study clearly shows that food systems are very complex in an urban setting, more complex than in a rural setting. In the process of urbanization, Kathmandu has developed a different kind of spatial relationship for the supply of foodstuff. The social organization related to food production and distribution has also changed. Families now depend mainly on the market for their food supply. With the adoption of

economic liberalization policies in a big way since the 1980s, the market has directly and adversely affected each family's food security.

With the growth of urbanization, the Kathmandu valley's ability to feed its residents has been drastically reduced. Even though government statistics show that Kathmandu valley produced enough food to meet its food requirements until the early 1970s, instances of food imports (mainly rice) from Tarai were also evident. But this was mainly utilized for feeding the military and civil servants. The available records show that food has been imported from Tarai at least since Rana Prime Minister Janga Bahadur's time (1846). But at that time only rice was imported. At the same time, it had been a long tradition among royal families and elite to import high quality foodstuff from various parts of the country to suit their taste.

At present, Kathmandu is dependent mainly on India for the supply of not only rice, but also other commodities like pulses, fruits and vegetables. This import is controlled by only a handful of business persons. From the traffic survey at Thankot conducted for this study, as many as 300-600 trucks were found to enter the Kathmandu valley daily, about 30% of them carrying foodgrains, fruits and vegetables. Of these, about 80 % carried foodgrains, 16 % carried fruits and 4 % carried vegetables. From the information collected it is revealed that 90 % of the food (cereals, pulses, oil, fruits and vegetables) supplied to Kathmandu comes through the private sector. Food (rice) distributed from Nepal Food Corporation (NFC) was estimated to constitute about 15 % of the rice consumed in Kathmandu valley while 85 % of the rice, and almost all other food items are supplied from the private sources, i.e., from India.

The survey at the household level conducted in different communities indicates that the food security situation is very precarious for many households. Only the households in settlements located at the periphery, and thus having food production opportunities, were found to be in a better situation. Traditional skills possessed by the residents of these communities and the opportunities to utilize those skills because of the growth in house construction in Kathmandu were found to provide additional income to purchase additional food in these communities. On the other hand, large proportions of the residents of fully urbanized neighborhoods were found to have consumed less than the required amount of food. One of the reasons for the estimation of low consumption level in these communities is that it is difficult to gather information about food consumption because of involvement of its residents in jobs, schools and business, which require frequent eating away from home. Since

questions were asked only about food purchased, exchanged and produced at home, these data indicate a change in consumption patterns rather than deficit in consumption. A large proportion of households in these communities had comparatively higher income, and they invested relatively lower proportion of income on basic foodstuffs. This shows that food security is comparatively better here. Various other indicators of capability like sickness and education showed that residents of these neighborhoods were comparatively better off than other communities. But there were also vulnerable households in these communities even though their number was small.

The food security situation in squatter settlements was very precarious, not only in terms of low food consumption for a large section of the society, but also in terms of human capabilities like sickness and education. As many as 40 % households were found to have one or more chronically sick members.

One of the main conclusions of this study is that income level, expenditure on food as a proportion of income, and the level of human capability (lack of sickness and higher education) are good indicators of food security in fully urbanized areas where it is difficult to estimate amount of food consumed. In our previous research, conducted in rural areas (Adhikari and Bohle 1999), food consumption levels were positively correlated with human capabilities (particularly physical capacity of the family). It was also comparatively easier in village situations to gather information about food consumption at the household level because food was largely consumed at home. Moreover, all households in the villages were exposed to similar environment in terms of water quality and medical attention.

Livelihood strategies adopted by families in different communities in Kathmandu valley were also found to vary. In poorer communities with low education and no skill, a wide array of strategies were found to be adopted to secure the livelihood. As we moved to areas with higher education and towards the core of the city, livelihood was based on relatively a few activities like salaried jobs, business or house renting. Traditional skills were also found to play an important role in securing the livelihood.

With the growth in urbanization, the food habits and nature of food consumed have also changed. Old citizens interviewed revealed that they used to consume homemade snacks and food, which used to be of high quality. But now families' consumption of ready-made food has increased. Ready-made food (like sweets, bread, biscuits, noodles and soft drinks)

produced at shops or at factories were not considered good for health by these elderly people. The main concern of families in all settlements was the rapid increase in prices of food and a drastic decline in their quality due to adulteration. Statistics also indicate that food prices have skyrocketed, especially in the 1990s when the government has implemented the liberalization in economy as a part of Structural Adjustment Program. The cuts in employment and decline in wage rates were found to have clear effects on the livelihoods of families, especially those with no skill and education. The affected families (especially from the squatter settlements) were found to resort to desperate survival strategies like collecting foodgrains, vegetables and fruits thrown away as waste by the traders and farmers, and collecting wild plant materials. Accordingly this study clearly indicates that there can be considerable variation within an urban area in food security situations, and that there exist certain groups of people who are in a particularly precarious situation. The general tendency of revealing only an average situation about Kathmandu valley (or districts) seems to be dangerous, as it would surely render invisible the vulnerable people.

This study also has clear implications for improving food security in Kathmandu valley. It is seen that education and skill are most important to secure a living in an urban context. Similarly, the importance of means for improving human capabilities in terms of maintaining a healthy living environment (like clean water supply and health care access) are shown by the fact that most of the vulnerable families have sick members. Families directly relate their food insecurity to the rise in prices of food and deterioration in its quality. This has resulted not only from the government's policy of giving priority to market institutions, but also due to collusive behavior of business persons.

As our study revealed, there are comparatively few business persons dealing with the imports of food (on which Kathmandu is now dependent). It is they who can create a situation where low-income families cannot purchase food. Even in the past, as discussed earlier, businesspersons sometimes created artificial food shortages to increase the price, causing greater hardship to the poorer people of Kathmandu. To ensure that this situation does not happen again, government should also be involved in supplying food or prepare itself to avert that likely scenario, and should redirect its policies so that people do not become the victims of market institutions and callousness of the business persons. Despite the precarious situation of food security for some groups of people in the Kathmandu valley (mainly migrant workers and low-income families), the

government has not implemented any formal social security measures. On the contrary, the government's policies in recent years have adversely affected the workers, and low-income families. Moreover, the traditional or the informal security system has almost collapsed. As history has shown, this is the most critical period in which food crises can occur. In such circumstances, as Dreze and Sen (1993) argue, public action is required to pressurize government to take responsibility to avert the potential crisis. The forms of the public action that are generally effective are regular reporting in the newspaper as an early warning, social criticism, and adversary politics.

Acknowledgments

We would like to thank the International Geographical Union for financial support for this research. We are grateful to three SINHAS readers for suggestions for revisions in an earlier draft of this paper and to Mary Des Chene for editorial help.

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